CLAIMS

1. A receiver front-end (6) for use in a transceiver station (3) of a wireless communication network (1), said transceiver station (3) being associated to an antenna assembly (5) comprising a primary and at least a secondary antenna (9, 10), said receiver front-end (6) being adapted for insertion between said antenna assembly (5) and signal processing sections (8) of said transceiver station (3), said receiver front-end (6) including a primary and at least a secondary receiving branch (12, 15), said primary receiving branch (12) being adapted for coupling to said primary antenna (9) and to said signal processing sections (8) of said transceiver station (3) and said secondary receiving branch (15) being adapted for coupling to said secondary antenna (10) and to said signal processing sections (8), characterized in that said primary receiving branch (12) comprises non-superconducting components, including at least a non-superconducting filter (17), and said secondary receiving branch (15) comprises at least a superconducting component.

2. The receiver front-end according to claim 1, characterized in that said primary receiving branch (12) does not comprise superconducting components.

3. The receiver front-end according to claims 1 or 2, characterized in that said superconducting component comprise a low-loss filter (23) obtained with a technology based on high critical temperature superconducting materials.

4. The receiver front-end according to claims 3, characterized in that said secondary receiving branch (15) comprises a cryogenic, low-noise amplifier (24) cascade connected to said low-loss filter (23).

5. The receiver front-end according to claim 4, characterized in that said low-loss filter (23) and said cryogenic, low-noise amplifier (24) are both enclosed in a cryogenic refrigerator unit (22) operating at cryogenic temperatures.

6. The receiver according to any of claims 1-5, characterized in that said primary receiving branch (12) comprises a non-superconducting receiving filter (17) and a non-cryogenic, low-noise amplifier (18) mutually connected in cascade arrangement.

7. The receiver according to any of claims 1-5, characterized in that said primary receiving branch (12) comprises a non-superconducting receiving filter (17) and a cryogenic, low-noise amplifier (18) mutually connected in cascade arrangement.

8. The receiver according to claim 7, characterized in that said low-loss filter (23), said cryogenic, low-noise amplifier (18) of said primary receiving branch (12) and said cryogenic, low-noise amplifier (24) of said secondary receiving branch (12) are enclosed in a cryogenic refrigerator unit (22).

9. The receiver front-end according to any of claims 5-8, characterized in that said cryogenic refrigerator unit (22) operates at cryogenic temperatures lower than 250 K.

10. The receiver front-end according to any of claims 5-9, characterized in that said cryogenic refrigerator unit (22) operates at cryogenic temperatures lower than 100 K.

11. The receiver front-end according to any of claims 5-10, characterized in that said cryogenic refrigerator unit (22) operates at cryogenic temperatures higher than 60 K.

12. The receiver front-end according to any of

claims 3-11, characterized in that said low-loss filter (23) has a noise figure lower that 0.7 dB.

13. The receiver front-end according to any of claims 3-12, characterized in that said low-loss filter (23) has a noise figure lower that 0.5 dB.

14. The receiver front-end according to any of claims 3-13, characterized in that said low-loss filter (23) has a noise figure lower that 0.3 dB.

15. The receiver front-end according to any of claims 1-14, characterized in that said primary receiving branch (12) is connected in parallel to a primary transmission branch (11), said primary transmission branch (11) comprising a transmitting filter (16).

16. The receiver front-end according to any of claims 1-15, characterized in that said secondary receiving branch (15) is connected in parallel to a secondary transmission branch (27), said secondary transmission branch (23) comprising a transmitting filter (30).

17. The receiver front-end according to claim 16, characterized in that said transmitting filter (30) comprised in said secondary transmission branch (27) is obtained with a technology based on high critical temperature superconducting materials.

18. The receiver front-end according to any of claims 1-17, characterized in that it is mounted at such a distance from said antenna assembly (5) that losses due to antenna lead-in are negligible with respect to the noise figure introduced by said receiver front-end (6).

19. The receiver front-end according to claim 18, characterized in that said distance is no greater than 3 m.

20. The receiver front-end according to claims 18 or 19, characterized in that said distance is no greater

than 1 m.

21. A method for improving reliability of a receiver front-end (6) for use in a transceiver station (3) of a wireless communication network (1) comprising the steps of:

- sending primary and secondary radio signals to a primary and, respectively, a secondary antenna (9, 10), said primary and secondary antenna (9, 10) being included in an antenna assembly (5) comprised in said transceiver station (3);
- filtering said primary radio signal at non-cryogenic temperatures;
- processing said secondary radio signal at cryogenic temperatures; and
- sending the resulting primary and secondary radio signals to signal processing sections of said transceiver station (3).

22. The method according to claim 21, characterized in that said step of processing said secondary radio signal at cryogenic temperatures comprises the step of:

- filtering said secondary radio signal to select a desired frequency band within a communication band; and
- amplifying said filtered secondary radio signal without introducing any significant losses.

23. The method according to claims 21 or 22, characterized in that it comprises the step of amplifying said primary radio signal at non-cryogenic temperatures.

24. The method according to claims 21 or 22, characterized in that it comprises the step of amplifying said primary radio signal at cryogenic temperatures.

25. A transceiver station (8) comprising a receiver front-end (6) according to any of claims 1-24 and signal processing sections (8) coupled to said receiver front-end (6).